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INTERNATIONAL BULLETIN OF PLANT PROTECTION

DISCOVERIES AND CURRENT EVENTS *

Western Australia : *Penthaleus destructor* (1).

Penthaleus destructor, known locally as the Red Legged Earth Mite, is a very serious pasture pest in the State of Western Australia. This mite attacks in particular clovers, potatoes, peas, cape weed, and to a lesser extent wheat, oats, barley and other cereals.

We should be glad to be favoured with any information concerning the following questions :—

(1) In which countries the legumes etc. are attacked by this mite.

(2) The gravity and extent of the damage.

(3) The methods of control hitherto employed, the results obtained and possible additional methods.

(4) Whether natural enemies of the mite exist, and if they have been found of any practical value.

United States of America : Outstanding Entomological Features (2).

Unusual numbers of grasshoppers appeared late in the season in the western Great Plains States and the northern Rocky Mountain region and considerable apprehension is felt as to the outlook for next year.

The Hessian fly (*Phytophaga destructor* Say) seems to be decidedly more numerous in southern Iowa and Nebraska, Illinois and Missouri than for the past few years. Nebraska reports that a new outbreak is starting in the southeastern part of the State, and a general outbreak is reported from Missouri.

The fall armyworm (*Laphygma frugiperda* S. & A.) continues to be reported as destructive in the Southern States. It destroyed many acres of winter spinach in the Norfolk district of Virginia and it completely destroyed newly-seeded alfalfa at one locality in Mississippi.

The clover seed midge (*Dasyneura leguminicola* Lint.) has been seriously reducing seed yields in many districts in southern Idaho, and the clover head caterpillar (*Laspeyresia interstinctana* Clem.) is doing considerable damage to the seed crop in parts of Nebraska.

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* In this, as in the two next chapters, the countries are arranged in French alphabetical order.

(1) Communication from the official correspondent of the Institute, Mr. L. J. NEWMAN, F. E. S., Economic Entomologist, Department of Agriculture, Perth, Western Australia.

(2) Communication from the official correspondent of the Institute, Mr J. A. HYSLOP, Senior Entomologist in Charge, Insect Pest Survey, Bureau of Entomology, United States Department of Agriculture, Washington, D. C.

The pear psylla (*Psylla pyricola* Foerst.) has been reported for the first time as a serious pest in southwestern Illinois.

Very considerable injury by the oriental fruit moth (*Laspeyresia molesta* Busck) is reported from New Jersey to Georgia, and from Michigan to Tennessee.

The plum curculio (*Conotrachelus nenuphar* Hbst.) is going into hibernation in phenomenally large numbers in Georgia and Tennessee.

The numbers of the walnut husk fly (*Rhagoletis juglandis* Cress.) have been very materially reduced in the Chino-Pomona district in California by the practice of control measures.

No field infestation of the Mediterranean fruit fly (*Ceratitis capitata* Wied.) was found in Florida or elsewhere in the United States during October 1929, nor were any adults of this insect collected in traps.

The citrus whitefly (*Dialeurodes citri* Ashm.) seems to be quite generally troublesome in the Gulf section from Florida to Mississippi.

The southern green stink bug (*Nezara viridula* L.) has ruined the winter truck crops in several localities in the Southeastern States.

The first eggs of the vegetable weevil (*Listroderes obliquus* Gyll.) for this season were observed about October 1, 1929 in the vicinity of Gulfport, Miss. This insect is now known to occur in 85 counties in four of the Gulf States.

The pepper weevil (*Anthonomus eugenii* Cano) has very seriously affected the crop of peppers in parts of New Mexico, Texas, and California. This insect has also seriously injured eggplant in southern California. This was of the Japanese variety. The common eggplant did not seem to be infested.

Additional reports of the finding of the Mexican bean beetle (*Epilachna corrupta* Muls.) continued to be received during September and October 1929. The range of this insect now extends well up into Michigan, New York, and Massachusetts. The spread to the south and west has been negligible.

The southern pine beetle (*Dendroctonus frontalis* Zimm.) is appearing in rather decidedly outbreak numbers in several localities in western North Carolina.

An infestation of the pink boll worm (*Pectinophora gossypiella* Saund.) has recently been discovered near Phoenix, Ariz.

Eritrea: Desert Locusts (*Schistocerca gregaria*) from July to October, 1929 (1).

During the whole month of July 1929 control measures were carried out against locally developed locusts on the upland plateau. Seraè and Hamasien were entirely freed from them; in Acchelè Guzai a few small groups escaped destruction and took flight. During the latter half of the month swarms of locusts from Abyssinia came into Acchelè Guzai, some of which laid eggs in Merettà Sebenè. Other swarms from the eastern plains did damage among the coffee and citrus plantations in the region of the eastern hills and then flew west, alighting in the Anseba valley. Swarms from the east and others from the south, after crossing the western plain, laid eggs in the territory of the Commissariat of Cheren. A considerable destruction of locusts by birds, in particular by *Quaelea aethiopica* was observed. In Seraè a heavy mortality of "cucubtà" and adult locusts was also observed which was due to a bacterial disease.

From the beginning of August 1929 and throughout the whole month large swarms of locusts from the region south of Ascianghi invaded the Colony usually

(1) Communication from the official correspondent of the Institute, Dr. A. De Benedictis, Capo dell'Ufficio Agrario del Governo dell'Eritrea, Asmara.

following the route Senafè-Adi Caieh-Saganeiti-Asmara. From Asmara some swarms followed the Anseba valley through Zazega, Demsabai, etc.; others went north to Dembezan and descended the valley of the Maldi and the Brancaga; and others again after havng crossed the ridge between Belesa and Quazien flew north, keeping always to the region of the eastern hills.

A heavy mortality was observed among these swarms, caused probably by a fungus disease, and many swarms were completely wiped out in the Asmara district.

A great deal of damage was done for the crops at Scimezana, Zebaonti, Aretò, Decchi Digna, Zenadeglè, Enganà, Dericien, Merettà Sebenè, Mezzehè, Lamza, Saharti, Chebessà Ciua, Asmara, Decchi Atescin, Loggo Ciua, Tecchelè Agghebà, Minabe Zerai, Dembezan, South and North, Carnescim and Scioatte Anseba, over an area of about 40 000 hectares in all, were almost completely destroyed. The locusts were already yellow and copulating.

During August locusts were hatched at Daura, Alet, Madbabaiè, Hummaret, Garabit, Carcabat, Tessenei, Sabderat, Gulsa, Biscia, and Agordat in the western plain; and at Fecchia Cocahat, Marad Colom (plain of Hazamò), in the Hadadem Cialò and Decchi Tehesta on the upland plateau.

Eggs were laid at Chigilla, Incinet, Darotai, Melillo, Cherù, Uaccai and Biscia in the western plain.

In September 1929 hatching was reported on the upland plateau in the following localities :— Piana di Selet, Valle Gulè, Fecchia Cocahat, Marad Colom, Hadadem Cialò, and Decchi Tehesta, and in the western plain at Tessenei and in the Sabderat zone. The locusts were destroyed wherever they hatched before they could begin to migrate.

A few small swarms were reported during the first half of September, but during the last ten days of the month numerous large swarms were reported.

On September 25 a swarm with an uninterrupted front of 12 km, invaded the plateau of Mai Feccia destroying almost completely the crops at Teramnì, Emni Tzellim, Addi Ghedda, Debaroa and Scichetti. The same swarm then flew over Acchelè Guzai and caused serious damage there also.

Other swarms carried their work of destruction into the territory of Dedà, Zelalè, Habelà, Himbirti (Loggo Ciua) and then over the whole of the Seraè.

During the first half of October 1929 the invasions from Abyssinia continued and in addition came considerable swarms from the Sudan. These went up the Barca and Gasc valley carrying destruction everywhere, and then descended into the eastern plain, staying for some days in the hilly region.

The Abyssinian swarms after flying over the regions of the upland plateau also descended into the plain.

Hatchings were reported during the whole month in the western plain, specially in the Anglo-Egyptian Sudan frontier zone.

Control was continued by means of poison bait.

Dominican Republic : Notes on some Crop Pests (1).

Cotton. — *Pectinophora gossypiella* ('oruga rosada del algodón'). All species and strains of cotton are attacked to some extent. For the control of the insect it is essential to avoid growing cotton during the hot months and to eliminate

(1) Communication from the official correspondent of the Institute, Dr. G. Russo, Jefe del Laboratorio de Entomología de la Estación Nacional Agronómica y Colegio de Agricultura, Moca (República Dominicana).

all plants of wild or semi-wild cotton. It would be useful to divide the territory of the Republic into two zones, North and South, and to grow cotton one year in the South zone (provinces of Barahona, Aqua, Santo Domingo, San Pedro de Macoris, Sejbo), and the next year in the North zone (provinces of Monte Cristy, Santiago, Puerto Plata, Espaillat, La Vega, San Francisco de Macoris, Samaná).

Sweet Potato. — *Cylas formicarius* (' tiogan '). This insect shows a decided preferece for one variety rather than another, though no variety can be said to be immune. Spraying with 1 % lead arsenate kills the adult insects ; fumigation with carbon disulphide (50 gm per 100 litres) kills eggs, larvae, pupae, and adults within 6 hours.

Onions . — It has been observed that *Thrips tabaci* does not develop on onions grown in shade. Spraying with an infusion of tobacco waste (500 gm in 5 litres of water) is effective.

Coconut palm. — The worst insect pests are *Aspidiotus destructor* (' escama blanca-amarilla ') and *Strategus quadrifoveatus* (' catarrón ').

Cabbages. — Excellent results have been obtained in the control of *Plutella maculipennis* (' oruga verde ') by spreading powdered lead arsenate or tobacco dust in the morning.

Beans. — *Empoasca mali* (' chinche verdosa - saltona ') has been completely controlled by spraying with infusions of tobacco waste or using tobacco dust.

Pineapples. — The worst insect pest is *Pseudococcus brevipes* (' chinche harinosa ').

Tobacco. — *Apanteles americanus*, reported in Jamaica as a parasite of *Protoparce sexta* (' gusano verde ') — a serious pest of tobacco and other Solanaceous crops in the Republic — occurs also in Cibao, but has not been observed as an enemy of *Prot. sexta.*

Tomatoes. — *Telenomus megacephalus* has been observed as a parasite on the eggs of *Nezara viridula* (' chinche verde grande ').

Tripolitania: Locusts (1).

On 29 December 1929 in the district between Homs and Zliten (Uadi Caam) a swarm of locusts about 4 km. in extent was reported flying in an easterly direction. No appreciable damage to crops took place.

Tripolitania : Swarms of Desert Locusts (2).

From the end of December 1929 till the beginning of February 1930 numbers of large swarms of desert locusts (*Schistocerca tatarica* = *Schist. gregaria*) arrived in Tripolitania from north-west Africa.

It is thought that such invasions, which have not occurred for many years, are due to the wind remaining constantly in the 3rd quadrant.

Up to the present the locusts have done no damage because the natives have easily driven them from their crops. The locusts stayed on the ground from 24 hours to 3 or 4 days, then they took flight again in swarms following the direction of the wind.

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(1) Communication from the Ministero delle Colonie, Roma, to the International Institute of Agriculture.

(2) Communication from Dr. G. Leone, Director of the R. Ufficio per i Servizî Agrarî della Tripolitania, Tripoli, to the International Institute of Agriculture.

No eggs have yet been laid.

The Government of Tripolitania as a precaution against invasions of hoppers has already arranged for the purchase of the necessary equipment for control measures, which when required will be brought together with all the means regarded as practical and effective.

Control of the adults, apart from catching for food purposes by the natives, is not being carried out because they are already in an advanced stage of development, flying with the utmost ease and are able to change at any moment from one place or locality to another.

VARIOUS QUESTIONS

Dusting and steeping of cereal seeds. *

Austria (1). — The treatment of seed grain with powders (dusting) has not taken hold in Austria to the extent that might have been expected from the simplicity of the process and the satisfactory results which have been obtained with certain of the disinfectant dusts on the market. The reason is that in spite of the extensive verbal and printed propaganda undertaken by plant protection institutions farmers in the mass have not yet recognised the value and necessity of seed disinfection. Small farmers moreover even now prefer steeping to dusting because they possess the equipment required for steeping and not that for dusting. Also it must be noted that the relatively small bulk of seed needed by the small farmer is easily dried. Another factor which should not be forgotten is the strong influence of routine.

The Plant Protection Station at Vienna has tested the efficacy of a certain number of dust disinfectants. Good results have been obtained with ' Abavit B ', ' Katagel ', ' Salvocer ', ' Tillantin ', ' Porzol ' and ' Tutan '. These products are sometimes used on the large farms.

Dusting might very easily be carried out, on receipt of payment, by the seed stores at the time of cleaning the seed. An endeavour ought to be made to obtain that seed disinfection should be legally compulsory, the sale of disinfected seed alone being allowed. Seedsmen should procure machinery for dusting as well as for cleaning. In this way the farmer could be freed from the work entailed in seed disinfection, and the seedsman by a small increase in the price of his seed could easily compensate himself for the slight extra cost involved. Special dusting machines are on the market. This would at any rate be one method of bringing about quickly and universally the control of cereal smuts.

Cirenaica (2). — In consideration of the limited development of cryptogamic diseases and of agriculture in Cirenaica experience with fungicidal treatments is

* Continued from No. 3.

(1) Communication from the official correspondent of the Institute, Hofrat Dr. Gustav Köck, Bundesanstalt für Pflanzenschutz, Wien.

(2) Communication from the official correspondent of the Institute, Dr. Giuseppe Piani, Director of the R. Ufficio per i Servizî Agrarî della Cirenaica, Benghazi.

slight and not such as to warrant up to the present a preference for any particular method of control.

At the moment, however, solely on account of convenience in handling the " Polvere Caffaro " is preferred.

Eritrea (1). — No experiments with fungicidal treatments of cereal seeds have yet been carried out in the Colony but an investigation will be set on foot in the near future.

United States of America (2). — Dust seed disinfectants for treating cereals are becoming increasingly popular in the United States. Some of them such as copper carbonate have come into general use but others are only just being introduced or are in the experimental stage. In the case of the dusts mentioned below, except formaldehyde dust, certain principles must be observed. In general seed should be thoroughly cleaned before treatment., The dust and grain should be well mixed in a tight mixing machine — not merely shoveled over on the floor. The dusts are poisonous (except sulphur) and so a mask should be worn over the nose and mouth when treating. Treated grain should not be used as food or for feeding animals.

Copper carbonate dust has now largely replaced liquids in the control of stinking smut of wheat (*Tilletia tritici* and *T. laevis*) in the United States. It also is the most satisfactory seed disinfectant for the smut of millet (*Chaetochloa italica*) caused by *Ustilago crameri*, for flag smut of wheat (*Urocystis tritici* and stem smut of rye (*Urocystis occulta*), and controls covered kernel smut of sorghum (*Sphacelotheca sorghi*). A finely ground copper carbonate is necessary for effective disinfection. The product containing 50 per cent copper is used at the rate of 2 to 2 ½ ounces and that containing 20 per cent copper is used at the rate of 3 to 4 ounces per bushel. According to Porter, Yu and Chen (1928) copper carbonate, dry Uspulun and dry Tillantin B are effective in controlling millet smut (*Ustilago crameri*); and (1929) copper carbonate and dry Uspulun controlled covered smut (*Ustilago hordei*) of hulless barley, and reduced stripe (*Helminthosporium gramineum*) to a marked degree. Furthermore the treatments were said to have increased the yields of hulless barley considerably beyond that due to the reduction of these two diseases.

Formaldehyde dust, prepared by mixing formaldehyde with infusorial earth, has given excellent control in the two smuts of oats in experiments and tests at the Ohio Experiment Station. A 5 per cent formaldehyde dust used at the rate of about 3 ounces per bushel is most effective. The treatment need not be in a closed container but the grain should be left in sacks for several hours before sowing. Although the dust has not come into general use as yet it has possibilities of gradually replacing the spray and liquid formaldehyde treatments that are now in use.

Sulphur dust at the rate of 2 ounces per bushel gives satisfactory control of the covered kernel smut of sorghum, finely ground sulphur being bet-

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(1) Communication from the official correspondent of the Institute, Dr. A. De Benedictis, Capo dell'Ufficio Agrario del Governo dell Eritrea, Asmara.

(2) Communication from the official correspondent of the Institute, Dr. R. J. Haskell, Pathologist in Charge, Plant Disease Survey, Bureau of Plant Industry, United States Department of Agriculture, Washington, D. C.

ter than the flowers of sulphur. It is as effective as the copper carbonate and not so expensive.

Ethyl mercury chloride sold in the United States under the trade name Ceresan has given satisfactory results in controlling stinking smut of wheat, covered smut (*Ustilago hordei*) and stripe (*Helminthosporium gramineum*) of barley, loose smut of Tennessee winter barley (*Ustilago nuda*), the smuts of oats (*Ustilago avenae* and *U. laevvis*), and covered kernel smut of sorghum.

Other commercial dust disinfectants have been found effective for controlling certain cereals diseases. LEUKEL (1929) and LEUKEL, DICKSON, and JOHNSON (1929) found that Abavit B, Trockenbeize Tillantin and WaWa gave control of covered smut of barley in their tests, reduced loose smut in barley from 0.7 per cent to a slight trace, and gave perfect control of stinking smut of wheat Other commercial dusts which controlled stinking smut of wheat without seed injury were Vitrioline, S. F. A. 225 and 225 V, Dupont 68, and Ceresan. Stripe of barley was practically eliminated in every trial with Ceresan, Trockenbeize Tillantin, and Wa Wa. HOLBERT (1928) has reported increased yields of maize through seed treatment with the mercury dusts — Improved Semesan Jr., Merko and Bayer Dust used at the rate of 2 ounces per bushel. These disinfectants are primarily to kill certain seed-borne pathogens which cause ear and root rots, principally *Diplodia, Gibberella* and *Basisporium.* Treated seed cannot always be expected to give increased yields as effectiveness depends upon many factors such as degree and kind of seed infestation,variety of maize, weather and soil conditions.

Hungary (1). — Our Phytopathological, Biochemical and Seed Testing Stations have carried out numerous experiments in dusting seed with the products ' Porzol ', ' Tillantin ', ' Triamid ', ' Tutan ', ' Resopor ' and ' Arzopac '.

It appears however that the practical importance of these products has been exagerated ; they are much more expensive than the salts used for steeping, and their use can be recommended only in countries in which water is scarce or difficult of transport. We understand also that successful experiments with these products have not been made in Germany and it is probable that in countries with a more humid climate steeping is preferable.

Professor SCHAFFNIT in particular has stated that the beneficial results obtained in Hungary are not applicable to Germany, which has a climate differing in temperature and humidity. He stafes, however, that dusting is a protection against infection by *Fusarium,* which is somewhat rare in dry countries such as Hungary.

Malta (2). — The treatment of seeds with chemicals for cryptogamic diseases is not yet adopted on an extensive scale in these Islands, but farmers who seek advice for this preventive treatment are supplied with sulphur powder containing 5 per % of sulphate of copper, which is thoroughly mixed with the seeds some time before sowing. The ' Polvere Caffaro ' is also used in the same way. The liquid treatment (5 per cent solution of copper sulphate) has only been used experimentally.

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(1) Communication from the official correspondent of the Institute, Hofrat Dr. A. VON DEGEN, Leiter der Samen-Kontrollstation, Budapest.

(2) Communication from the official correspondent of the Institute, Prof. J. BORG, M. A., M. D., Superintendent of Agriculture, Valletta, Malta.

Poland (1). — The results of seed disinfection trials against cryptogamic diseases of cereals, carried out lately by phytopathological institutions in Poland, show that dusting the seed with certain powders may satisfactorily be used in place of the old method of steeping in solutions of formol or copper sulphate or other recent liquid disinfectants, such as ' Uspulun ', ' Germisan ', etc.

In experiments in the control of bunt of spring wheat (*Tilletia tritici* Wint.) carried out at Bydgoszcz in 1929 in the trial plots, ' Ziarnik ', a new Polish disinfectant, used in a percentage of 0.2 to 4 %, excelled in efficiency copper carbonate and acetate. The percentage of contaminated ears on the plots sown with seed dusted with ' Ziarnik ' was 0.25 %, while on the plots with seed dusted with copper carbonate (0.4 %) it was as much as 1 %, and on the plots with seed dusted with copper acetate (0.4 %) 1.4 %. The control plots of untreated seed were contaminated to 18.3 %, and the plots with seed steeped in a 0.1 % solution of formol for 15 minutes to 0.2 %. Thus it is seen that the disinfecting capacity of ' Ziarnik ' was practically equal to that of the formol. The germinative capacity of the seed was not reduced by the treatment.

' Ziarnik ' has also proved effective against smut of oats (*Ustilago avenae* [Pers.] Jens.), 0 to 0.1 % of the panicles being infected against 2.3 % on the untreated plots.

The Plant Protection Station at Wilno reports that dusting wheat against *T. tritici* and rye against *Fusarium* was as efficacious as steeping in solutions of formol and copper sulphate. Three treatments were tried, ' Ziarnik ', ' Uspulun ' and ' Analyz ', and the best results were obtained with ' Ziarnik ' and ' Uspulun '.

Copper carbonate and ' Analyz ' were tested at Pulawy against *Urocystis occulta* Rabenh. on rye and *T. tritici* on winter wheat. The copper carbonate was more effective than the ' Analyz ' but was not as effective as formol solution.

Dusting wheat with ' Uspulun ' in pot experiments carried out at the Agricultural Experiment Station at Poznań reduced contamination by *T. tritici* to 5 %. The wheat in the untreated pots was 20 % infected, while steeping in formol solution, ' Germisan ', ' Porzol ' and certain other disinfectants gave a crop quite free from infection.

At the Agricultural Experiment Station at Opatowiec in the Plock district, ' Uspulun ' and ' Germisan ' used as dusts against smut of wheat showed the same efficiency as steeping in a 0.1 % solution of formol for 10 minutes. The degree of contamination was everywhere the same (0.1 %) against 31.0 % on the untreated plots.

Southern Rhodesia (2). — With regard to the use of chemical preparations for dusting seed in the control of cryptogamic diseases, the only substance which has been tested officially in Rhodesia is Tillantin R against *Diplodia zeae* in maize. No field trials have as yet been attempted. The following table shews the results of a recent laboratory pot experiment.

The figures given are for plants which appeared above the soil. In series (*d*) *c*, ten plants actually appeared but only seven survived. The treated seed in this series produced 100 % strong plants. It is considered that weak plants under field conditions are uneconomic.

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(1) Communication from the official correspondent of the Institute, Dr. L. Garbowski, Chef de la Section des Maladies des Plantes de l'Institut Agronomique de l'Etat, Bydgoszcz, Poland.

(2) Communication from the official correspondent of the Institute, Mr. J. C. Hopkins, Chief Botanist and Mycologist, Department of Agriculture, Salisbury, Southern Rhodesia.

Germination of Treated & Untreated Seed.

Series	a			b			c			d		
	1	2	c	1	2	c	1	2	c	1	2	c
Strong Plants	—	—	—	5	7	—	8	8	2	12	12	5
Weak Plants.	—	—	1	—	—	—	—	2	3	—	—	2
Killed Plants	—	—	—	—	—	—	—	—	—	—	—	3
Total . . .	—	—	1	5	7	—	8	10	5	12	12	10

Field trials with maize will be carried out to compare the following preparations :

Abavit B dust

Uspulun-Universal Soak

and the results will be communicated in due course.

Unfortunately time is not available for comparative trials with other cereals, which are of only minor importance as crops in this country.

Turkey (1). — During last season the Phytopathological Institute at Angora has made experiments with the various products and methods used in Europe for the control of bunt of wheat (*Tilletia laevis*) and seed disinfection to determine their behaviour under the conditions of Central Anatolia. The question of whether the dusting method of disinfection is to be recommended in Turkey was studied with special care. The field experiments were carried out following very closely the methods established and used by the German Plant Protection Service. In addition to the field experiments some laboratory tests were carried out to determine accurately the influence of the different methods of disinfection on the germinative capacity and vigour of the seeds.

The results led to the following conclusions :— dusting the seed with ' Abavit B, ' ' Abavit 1097 ' and ' Uspulun-Trocken ' is in Turkey a remarkably effective means of controlling bunt of wheat and covered smut of barley (*Ustilago hordei*). The efficiency of these products was nearly equal to that of the well-known disinfectant solutions ' Uspulun ' and ' Germisan '. Treatment of seed by one of the three products mentioned resulted in about fifty times fewer contaminated plants than in the control plots and no appreciable reduction was observed in the germinative capacity and vigour of the treated seeds.

In the parts of Anatolia having a very arid climate if the autumn seedings are effected early dusting is preferable to steeping. Cereal seeds absorb much water during treatment with a liquid disinfectant, even when the treatment is of relatively short duration. If seed thus disinfected is sown before the autumnal rains in a soil completely dried to some depth the first shower is enough to make it germinate because it is already swelled. But showers only moisten the surface layer of the soil while the deeper layers remain absolutely dry. If there is no further rain soon the young roots before long come in contact with soil which is deficient in moisture and the growth of the seedlings is checked and some of them die from lack of water.

Seed disinfected by dusting is preferable to steeped seed for sowing ; not being

(1) Communication from Dr. MÜLLER, Directeur de l'Institut phytopathologique d'Angora, transmitted by the official correspondent of the Institute, Mr. SUREYA, Conseiller d'Etat, Angora.

swollen at the time of sowing they germinate less rapidly after rain which penetrates only a few centimetres into the ground. If the first rain is a very slight shower the soil moisture is insufficient to allow the seeds to germinate, consequently the risk referred to above is greatly reduced.

Disinfection by immersion or steeping has however the advantage over dusting that it can be carried out with the most primitive of equipment, whereas dusting requires special apparatus to safeguard the health of the workers and to allow of a thorough mixing of the disinfectant with the seed.

EURYGASTER *SPP. AND THE DAMAGE IT CAUSES TO CEREAL CROPS IN DIFFERENT COUNTRIES* *

Brazil (1). — No species of *Eurygaster* has yet been observed on wheat or other plants in Brazil.

Italy (2). — According to Prof. F. SILVESTRI, Director of the Agricultural Entomological Laboratory of the Royal Higher Agricultural School in Portici, no species of *Eurygaster* appears to have attacked the wheat crops in Italy during recent years.

In the past *Eur. hottentotus* Fab. and *Eur. maurus* L. have been recorded as causing damage to wheat, but no accurate biological study of the two species has been carried out.

Prof. G. PAOLI, Director of the Royal Phytopathological Observatory for Liguria at Chiavari, states that there appears to be no species of *Eurygaster* harmful to wheat in his area.

FERRARI, in his Catalogue of Hemiptera of Liguria mentions *Eur. hottentotus* (of which *Eur. integriceps* would be a variety) as having been taken on *Inula* near Genoa and at Rapallo ; it would threfore appear not to be frequent.

In the Genoa Museum collections there are a few specimens of *Eur. hottentotus* taken at Genoa, Voltri, Busalla and Stazzano ; *Eur. integriceps* is represented by a few specimens from Persia.

MANCINI, who is a Hemiptera specialist, has said that *Eur. hottentotus* is very rare in Liguria and that he has never taken *Eur. integriceps*.

Thus in Liguria *Eur. hottentotus* does occur, but rarely and in isolated examples ; *Eur. integriceps* is not known there ; no species of *Eurygaster* or other Scutellerinae does any damage to wheat in Liguria or, if any, the damage is insignificant owing to the rarity of the individuals.

Prof. E. MALENOTTI, Director of the Royal Phytopathological Observatory for Veneto and Venezia Tridentina at Verona, states that he has never had occasion to report damage to wheat or other cereals caused by any species of *Eurygaster*.

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* Continued from No 3.

(1) Communication from the official correspondent of the Institute, Dr. Carlos MOREIRA, Director do Instituto Biologico de Defesa Agricola, Rio de Janeiro (Brasil).

(2) Communication from the R. Stazione di Patologia vegetale, Roma, official correspondent of the Institute.

Palestine (1). — *Eurygaster integriceps* is occasionally reported in Palestine sucking unripe grain, but its multiplication in numbers sufficient to cause damage has not been observed as yet.

Rumania (2). — *Eurygaster integriceps* does not belong to the fauna of Rumania, but *Eur. maurus* occurs widely in the country. The latter species has been found by MONTANDON in the provinces of Muntenia, Moldova and Dobrogea. It is found also in Transylvania.

The periodical ' Verhandlungen und Mitteilungen des siebenbürgischen Vereins für Naturwissenschaften ' (Vol. XIII, 1862, p. 16) records that the variety *pictus* has been found on *Telekia speciosa*.

Up to the present no serious damage has been observed.

Eur. hottentotus also occurs in Rumania. This species has not been found to be a pest either.

Uruguay (3). — No species of *Eurygaster* has yet been reported as causing damage to wheat in the Republic.

LEGISLATIVE AND ADMINISTRATIVE MEASURES

Spain. — By ' Real orden ' No. 2,307 of 8 November 1929 the Ministry of National Economy may authorise the importation from the Netherlands of the plants specified below having their roots covered with sufficient soil to ensure their being safely kept and their success when planted in their permanent position when the following conditions are observed by the Netherlands Phytopathological Service and the exporters :—

(1) Only those plants shall be admitted into Spain the roots of which are covered with the thinnest possible layer of soil and which belong to the following botanical genera and species : — *Araucaria imbricata, Azalea, Buxus* (exceeding 35 cm. in height and trimmed into geometric or other shapes) and *Rhododendron*.

(2) The necessary Customs House papers for the consignment or claiming of such plants must be accompanied by a certificate issued by the Netherlands Phytopathological Service conforming to the model annexed to the ' Real orden ', no item on which may be omitted. [This certificate conforms to the model annexed to the International Convention for Plant Protection (Rome, 16 April 1929). Cf. this *Bulletin*, Year III, 1929, No. 4, p. 55].

(3) The plants enumerated in § 1 must be presented at the Spanish frontier

(1) Communication from the official correspondent of the Institute, Mr. F. S. BODENHEIMER, Hebrew University, Jerusalem, Palestine.

(2) Communication from the official correspondent of the Institute, Mr. Wilhelm K. KNECHTEL, Bucharest.

(3) Communication from the official correspondents of the Institute, Mr. Jaime MOLINS (hijo), Ingeniero Jefe de la Sección Fomento y Defensa Agrícola de la Dirección de Agronomía, and Mr. Agustín TRUJILLO PELUFFO, Ingeniero Agrónomo Regional, attached to the above Section, Montevideo, Uruguay.

in wooden cases completely closed and sealed by officials of the Netherlands Phytopathological Service. The cases must bear on the outside an indication of the species they contain, which must be one of those specified in § 1.

(4) Consignments of plants to which this concession is applicable must be addressed to one or other of the following destinations :— Madrid, Barcelona, Valencia, Sevilla, or Bilbao.

(5) On the arrival at any frontier or Customs House of consignments of plants with soil the person concerned, *i. e.*, the person who has requested their importation into Spain, must present the duplicate of the demand for inspection by the Spanish Phytopathological Service at the destination, signed by a technical official of the Service ; the official of the Spanish Phytopathological Service who inspects plant products on arrival at the Customs House or frontier shall notify the arrival Customs House that the consignment may be withdrawn without inspection ; all packages containing plants with soil must however before being claimed be sealed by the Phytopathological Service of the arrival Customs House ; these seals must arrive intact at one of the destinations enumerated in § 4, where the packages with the seals of the Spanish Service also intact shall be submitted to inspection by the Phytopathological Service ; so long as the Service shall not have certified the healthy condition of the products inspected the latter may not be withdrawn by the consignee nor circulated freely on Spanish territory.

(6) If in a consignment of plants with soil the presence of a disease easily transmitted to crops is proved the responsible official of the Phytopathological Inspection Service shall order the consignment in question to be burnt in his presence and shall immediately notify the fact to the Ministry of National Economy, which will immediately suspend the admission of plants with soil, cited in § 1.

(7) Should the practical results of the importation of any other garden plants from the Netherlands show the impossibility of sending them with their roots freed from soil and washed, the Ministry of National Economy will examine the possibility of including such genus or species of plant among those specified in § 1, whenever it is not possible eventually to wash the roots and replace the original soil before transplanting the plants in Spain. (*Gaceta de Madrid*, Madrid, 7 diciembre 1929, año CCLXVIII, tomo IV, núm. 341, págs. 1543 y 1544).

France. — The importation of vines from Algeria is allowed provided that each consignment is accompanied by a certificate issued by the official Plant Protection Service of Algeria stating that :—

(1) the vines to which it refers were grown in Algeria at . . . . (name of place where the vines were grown) ;

(2) the said vines were inspected by the officials of the above-mentioned Service while growing and at the time of consignment and were found to be free from diseases and dangerous parasites.

On this condition the persons concerned are free from the obligation to obtain an importation permit in advance from the Ministry of Agriculture. (Ministère de l'Agriculture. Direction de l'Agriculture. *Bulletin de l'Office de Renseignements Agricoles*, Paris, 1930, nº 4, p. 68).

Italy. — Royal Decree-Law No. 2226 of 25 November 1929, which came into force on 1 January 1930, contains various provisions for agricultural experimental stations, which are of equal standing to the university scientific institutes. Only those Institutes enumerated in the list annexed to the Decree are considered as agricultural experiment stations.

Among the Royal agricultural experiment stations are included the Royal Agricultural Entomological Station at Florence, the Royal Cryptogamic Laboratory at Pavia and the Station of Plant Pathology at Rome.

Among the Syndical (' consorziali ') agricultural experiment stations is the Phytopathological Experimental Laboratory at Turin. (*Gazzetta Ufficiale del Regno d'Italia*, Roma, 21 gennaio 1930, anno 71°, n. 16, pp. 275-282).

*** In consequence of the necessity of controlling mole crickets in the province of Brescia by Ministerial Decree of 12 December 1929 the trapping and killing of moles have been prohibited in the province. (*Gazzetta Ufficiale del Regno d'Italia*, Roma, 18 dicembre 1929, anno 70°, n. 294, p. 5630).

*** By Ministerial Decree of 31 December 1929 the Commune of Camerana in the province of Cuneo has been declared infected with grape phylloxera. (*Gazzetta Ufficiale del Regno d'Italia*, Roma, 21 gennaio 1930, anno 71°, n. 16, p. 287).

*** By Ministerial Decree of 15 February 1930 the Commune of Murlo in the province of Siena has been declared to be infected with grape phylloxera. (*Gazzetta Ufficiale del Regno d'Italia*, Roma, 26 febbraio 1930, anno 71°, n. 47, p. 763).

*** A Ministerial Decree of 17 February 1930 provides for the sale of a new by-product of tobacco, called extract of normal tobacco (' estratto di tabacco normale '). (*Gazzetta Ufficiale del Regno d'Italia*, Roma, 3 marzo 1930, anno 71°, n. 51, p. 812).

Peru. — In order to prevent the introduction of the Mediterranean fruit fly (' mosca de la fruta del Mediterráneo ', *Ceratitis capitata*) into the Republic by ' Resolución ' of 2 August 1929 the importation of fresh fruit and vegetables from the following countries :— United States of America (except the States of California, Oregon and Washington), Central America, West Indies, Mexico, Bermuda and Hawai, has been prohibited until further notice. (*La Vida Agrícola*, Lima (Perú), 1929, vol. VI, no. 70, págs. 810 y 811).

*** By a ' Resolución ' of 20 September 1929 the destruction of olive trees has been prohibited in the Republic. Only such olives may be destroyed (with authorisation from the ' Dirección de Agricultura y Ganadería del Ministerio de Fomento ') as are attacked by a definite disease and are in immediate likelihood of dying and are unproductive on account of deficient growth. (*La Vida Agrícola*, Lima (Perú), 1929, vol. VI, no. 72, pág. 995).

*** By a ' Resolución ' of the same date the cotton fields in the valleys of the Piura, Lambayeque, Pacasmayo and Chicama are declared infected with *Gasterocercodes gossypii* (' gorgojo de la chupadera ') and consequently the exportation of cotton seed from these valleys into other parts of the Republic is prohibited. (*Ibid.*, págs. 995 a 996).

RECENT BIBLIOGRAPHY

Appel, Otto. Taschenatlas der Krankheiten des Beeren-und Schalenobstes. Berlin, Verlagsbuchhandlung Paul Parey, 1929, 29 S., 24 Farbendrucktaf.

Auchter, E. C., and Knapp, H. B. Orchard and small fruit culture. New York, John Wiley and Sons, Inc., 1929, pp. xvii + 584, 278 figs.

[Deals also with methods of controlling the pests and diseases of the plants under consideration].

Bodenheimer, F. S., Fraenkel, G., Reich, K., und Segal, N. Studien zur Epidemiologie, Ökologie und Physiologie der afrikanischen Wanderheuschrecke (Schistocerca gregaria Forsk.). *Zeitschrift für angewandte Entomologie*, Berlin 1929, Bd. XV, Heft 3, S. 435-557, Abb. 1-55.

Bodnár, J., Róth, Lili Eveline, und Tergina, Irene. Einfache und schnelle analytische Methode zur Bestimmung des Wirkungssubstanzgehalts von Pflanzenschutzmitteln. IV. Mitteilung. Die titrimetrische Bestimmung des Quecksilbers in Saatgutbeizmitteln. *Kisérletügyi Közlemények*, Budapest 1929, XXXII. k., 1 f., 69-88 o.
[Hungarian, with title and summary also in German].

Bongini, V. Parassiti di stagione. *Bollettino del Laboratorio Sperimentale (Regio Osservatorio regionale) di Fitopatologia*, Torino, 1929, anno 6°, n. 6, pp. 8-10.
[*Athous* sp. on Conifers and *Sinoxylon sexdentatum* on the pear, in Piedmont].

Box, Harold E. El efecto producido en la composición individual de las cañas de un surco por la infestación del taladrador (*Diatraea saccharalis*, Fabr.). *Revista Industrial y Agrícola de Tucumán*, Buenos Aires, 1929, tomo XIX, núms. 11-12, págs. 291 a 315, figs. 1 a 3.

Brauer, Ludolph, Mendelssohn Bartholdy, Albrecht, Meyer, Adolf, Lemcke, Johannes. Forschungsinstitute, ihre Geschichte, Organisation und Ziele. Erster Band. Hamburg, Paul Hartung Verlag, 1930, S. XVI + 470, 3 Bildnis, 5 Taf.
[Contents include : Entomologische Forschungsinstitute von Dr. Erich Titschack (pp. 406-411)].

Brown, Nellie A. The tendency of the crown-gall organism to produce roots in conjunction with tumors. *Journal of Agricultural Research*, Washington, D. C., 1929, Vol. 39, No. 10, pp. 747-766, figs. 1-10.
[*Bacterium tumefaciens*].

Bryan, Mary K., and McWhorter, Frank P. Bacterial blight of poppy caused by Bacterium papavericola, sp. nov. *Journal of Agricultural Research*, Washington, D. C., 1930, Vol. 40, No. 1, pp. 1-9, figs. 1-5, pl. 1.
[On *Papaver Rhoeas* and *P. orientale* in Virginia. The disease has been observed also in Connecticut].

Carbone, D., e Arnaudi, C. L'immunità nelle piante. Con prefazione di Serafino Belfanti. (Monografie dell'Istituto Sieroterapico Milanese). Milano, Stab. tipografico Stucchi Ceretti (Soc. An.), 1930, pp. XII + 274, 42 figg., 3 tav. a col.
[The work is divided into the following chapters, each of which has a bibliographical list : I. L'immunità negli animali. — II. L'immunità congenita nei vegetali. — III. L'immunità acquisita nei vegetali. — IV. I fattori umorali dell'immunità. — V. La fitoimmunità nella pratica].

Cecconi, Giacomo. Una farfalla che schianta i tronchi degli alberi. *L'Alpe*, Milano, 1930, anno XVII, n. 1, pp. 17-20, figg. 1-6.
[' Perdilegno rosso' (*Cossus cossus* L.) on the Canadian poplar at Fano, Italy].

Chabrolin, Ch. La pourriture de l'inflorescence du palmier dattier (*Khamedj*). *Annales des Épiphyties*, Sceaux, 1929, 14e année (1928), n° 5, p. 377-414, fig. 1-6, pl. I-II. Bibliographie, p. 412-413.
[*Mauginiella Scaettae* Cav.].

Chabrolin, Ch. Notes et observations relatives aux dépérissements de l'abricotier. *Annales des Épiphyties*, Sceaux, 1929, 14e année (1928), n° 5, p. 355-376, pl. I-V. Bibliographie, p. 373-374.
[In the Rhone valley].

CHEVALIER, AUG. Sur une Scrophulariée (*Striga hermonthica*) parasite des céréales en Afrique tropicale. *Comptes rendus hebdomadaires des séances de l'Académie des Scienes*, Paris, 1929, tome 189, nº 27, p. 1308-1310.

DELLA BEFFA, G. Su alcuni coleotteri poco noti nocivi al frumento. *Bollettino del Laboratorio Sperimentale (Regio Osservatorio regionale) di Fitopatologia*, Torino, 1929, anno 6º, n. 6, pp. 6-8.
[*Calamobius filum*, *Lema melanopus*].

DROGOUL, GIULIA. Sui processi di distruzione dei parassiti animali nelle castagne destinate alla esportazione. *R. Stazione Chimico-Agraria di Torino. Annuario* [Torino (?), 1929], vol. X, 1926-1928, pp. 301-307.
[The experiments show that the most effective method of controlling *Carpocapsa splendana* var. *reaumurana* and *Balaninus* sp. consists in heating the chestnuts to 50º in water and then drying them].

FERRARIS, T. Piante infeste alle coltivazioni. Il trifoglio acetoso o panicùcolo (*Oxalis corniculata* L.). *Giornale di Agricoltura della Domenica*, Piacenza, 1929, anno XXXIX, n. 51, p. 700, 4 figg.

FOEX. Le piétin du blé en 1928-29. *Comptes rendus des séances de l'Académie d'Agriculture de France*, Paris, 1929, tome XV, nº 29, p. 1005-1010.
[*Ophiobolus herpotrichus*, *Leptosphaeria herpotrichoides*, *O. graminis*, *L. culmifraga*, *Wojnowicia graminis*].

FRAENKEL, GOTTFRIED. Untersuchungen über Lebensgewohnheiten, Sinnesphysiologie und Sozialpsychologie der wandernden Larven der afrikanischen Wanderheuschrecke Schistocerca gregaria (Forsk.). *Biologisches Zentralblatt*, Leipzig 1929, 49. Bd., Heft 11, S. 657-680, Abb. 1-9.
[The observations were made in 1929 in Palestine].

FRIEDRICH, ADOLF. Die Fauna der Cacao-Plantage (Col.). *Entomologische Zeitschrift*, Frankfurt a. M. 1929, XXXXIII. Jahrg., Nr. 17, S. 206-210, 2 Abb.
[*Macropus longimanus* at Santa Catharina (Brazil)].

FRYDRYCHEWICZ, JULIUS. Nonnenstudien. *Zeitschrift für Pflanzenkrankheiten (Pflanzenpathologie) und Pflanzenschutz*, Stuttgart 1930, 40. Bd., Heft 1/2, S. 26-44, Abb. Ia, Ib, 2.
[*Lymantria monacha* L.].

GABOTTO, L. Nuove esperienze di lotta contro le tignole dell'uva. (Cattedra Ambubulante di Agricoltura per la provincia di Alessandria. Sezione di Fitopatologia di Casale Monferrato). Alessandria, Industria Grafica O. Ferrari, 1929, 16 pp., 7 figg.
[Reports the latest results of experiments with the arsenical dusts 'Meritolo' and 'Abruchite'].

GARCÍA MERCET, RICARDO. Afelínidos paleárticos (Hym. Chalc.). 3.ª nota. *Eos*, Madrid, 1929, tomo V, cuad. 3.º, págs. 215 a 222, figs. 1 a 3.
[The diagnosis is given in Spanish of *Prospaltella aspidioticola* n. sp., endophagous parasite of *Aspidiotus abietis* Schr. on *Pinus silvestris* in Spain; *Coccophagous krygeri* n. sp. (Spain and England) and *Encarsia indifferentis* n. sp. (Egypt); the life history of the two last species is not known].

GARCÍA MERCET, RICARDO. Los Afelínidos de España. *Revista de Biología Forestal y Limnología*, Madrid, 1929, año I, serie B, núm. 1, págs. 3 a 28, figs. 1 a 7.
[In this preliminary account of his work the A. discusses the morphology, biology, breeding and utilisation of the species and their preparation for study; 15 genera of *Aphelininae* are represented in the Spanish fauna with a total of 39 species].

GLEISBERG, W. Ein Universal-Pflanzenschutzgerät. *Illustrierte Landwirtschaftliche Zeitung*, Berlin 1929, 49. Jahrg., Nr. 44, S. 505-506, Abb. 674-681.

HOWARTH, W. O., and CHIPPINDALE, H. G. An example of high mortality in Rhododendrons. *The Gardeners' Chronicle*, London, 1929, Third Series, Vol. LXXXVI, No. 2242, p. 471.
[On diseased plants at Manchester, *Diplodina Eurhododendri* and *Pestalozzia macrotricha* and a fungus producing only sclerotia have been observed. But the initial cause of the disturbance appears to be the imperfect union of the scion and rootstock].

IONESCU, ELVIRA. Sur une déformation de *Digitalis purpurea* produite par des Aphidiens. *Comptes rendus des séances de la Société de Biologie et de ses filiales*, Paris, 1929, tome CII, nº 35, p. 967-968.

KOTTE, W. Der Bakterienkrebs der Tomate, eine für Deutschland neue Pflanzenkrankheit. *Zeitschrift für Pflanzenkrankheiten (Pflanzenpathologie) und Pflanzenschutz*, Stuttgart 1930, 40. Bd., Heft 1/2, S. 51-56, Abb. 1-4.
[*Aplanobacter michiganense*].

NOTES

Virus Diseases of Plants Committee, Great Britain. — The Ministry of Agriculture and Fisheries, London, with the concurrence of the Empire Marketing Board have recently enlarged the original Virus Diseases of Plants Committee, appointed in 1924 to consolidate the position in respect of plant virus disease research so far as England and Wales was concerned, by securing to serve on it the Directors of the Imperial Bureaux of Mycology and Entomology respectively, and one representative each from the Board of Agriculture for Scotland and the Ministry of Agriculture for Northern Ireland.

The Committee itself does not undertake research but it is a consultative and advisory body to which the Ministry of Agriculture and Fisheries and the Empire Marketing Board refer the applications that they may receive for assistance in the prosecution of research on virus diseases of plants. The approved schemes of research are financed by the Empire Marketing Board.

First Brazilian Congress for the Control of *Atta sexdens* (' formiga saúva '). — This Congress which met in 1929 at Taubaté in the State of São Paulo, in its resolutions drew the attention of the executive power to the necessity of issuing legislative provisions to regulate throughout Brazilian territory the organisation of a compulsory and systematic campaign against the ' formiga saúva ' (*Atta sexdens*) ; to the institution and diffusion of technical instruction on the control of the insect as basis of the economic solution of the problem ; to the adoption of measures for the reduction of transport costs on all material intended to be used in the control ; to the necessity of encouraging the study of new methods of control.

Prof. ALESSANDRO BRIZI, *Segretario generale dell'Istituto, Direttore responsabile.*

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